Collection Classes

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Collections of Objects

- **What if your object needs to contain multiple child objects?**

- **When you have one-to-many relationship**
    - Consider using a child collection

- **TextFile class could contain collection of Line objects**
    - Provide TextLines property that is a collection (a Lines object)

Using Built-in Collection Classes

- Easy to use VBA's Collection class

- Create instance of Collection class

- Call Add method to add items as needed

- Use For Each or For loop to retrieve items

- Use Count method to retrieve number of items

- Use Remove method to delete items

- Use Item method to retrieve a specific item

DEMO 1

- **Create collection instance and add items**

- **Add invalid item**

- **Show failure**

Creating Custom Collections

- **What's the Problem?**
  - You can put whatever you want into the VBA Collection object
  - A bad thing

- **What's the Solution?**
  - Create another class that "wraps up" a Collection
  - Implement your own methods and property

- **Bonus: Creating your own allows you to extend your collections**

Creating a Collection Class

- **Create a class representing a single item (Line)**

- **Create a class representing the collection (Lines)**

- **Add a private, internal Collection object**

DEMO 2

- **Create collection class**

- **Add internal collection**

Making the Class Work

- **Add a read-only Count property**

- **Add an Add method**
  - If scalar parameter, creates an instance of new object
  - Adds to internal collection

Finishing up the Collection

- **Add an Item method**

- **Add a Remove method**

DEMO 3

- **Finish up Lines class**

- **Demonstrate**

Extending Collection Classes

- **Creating your own collection class lets you add additional properties and methods**

- **Can add functionality that applies to the collection, not just individual objects**

- **Want to convert entire collection of lines to upper case?**
  - Add ToUpper method of collection class

DEMO 4

- **Extend collection class**

What's Missing?

- **Custom collection class doesn't work exactly like VBA's Collection class**

- **You lose two things you get for free with Collection:**
  - Default method (Item)
    - Must use full syntax
  - Enumeration function
    - Can't use For Each loops
    - Must use Count and For Next instead

- **Possible to work around these limitations**

DEMO 5

- **Investigate missing features**

Summary

- **You can easily create your own collection class**
    - Works much like built-in Collection
    - Doesn't provide default method (Item) or iterator
    - Can work around these, but tricky and fragile